

THE TEACHER AND AUTOMATION



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## INTRODUCTION

Walter E. Elliott recently said: "Automation started centuries ago. It was in existence when man first hooked a plow onto the back of a horse. It was here when Henry Ford was mass producing his tin lizzy. Indeed, it was present when the first prehistoric man carved out the first wheel. The only thing new is the name. Formerly it was called mechanization, modernization, production improvement, and assorted other things."

The American Federation of Teachers is currently concerned with the issue of automation and its relationship to teachers and education. A phase of this interest was expressed in our study, *Teaching Machines and the Age of the New Frontier*.

With the cooperation of President George Meany of AFL-CIO; Dr. Ewan Clague, U. S. Commissioner of Labor Statistics; and Deputy Commissioner of Labor Statistics Robert J. Myers, some of the principles and issues concerning automation are noted.

### MR. MEANY:

"Automatic and semi-automatic production methods are spreading into almost every type of work. Not since the industrial revolution of the 18th and 19th centuries has radical technological change affected such a large part of the economy and so many different kinds of jobs.

"New types of automatic machines and methods, symbolized by the term 'automation,' are being put to use rapidly and widely--in manufacturing and farming, railroads and mines, communications and clerical work, retail and wholesale trade. At the same time, older types of machines are being modernized and being made semi-automatic. The pace of technological change and its widespread application are speeding up.

"Although the present extent of automation differs from one industry to another, many departments, plants and offices already have converted to automatic and semi-automatic operations. Others are making the change-over now or are planning it for the future.

"In addition, new equipment and production methods are making yesterday's automation marvels out of date. Last year, the Texas Co., for example, linked automatic refining operations to an electronic computer and started operations of a computer-controlled refinery, described as 'the first fully automatic computer-controlled industrial process.' Other computer-controlled automatic plants are being built at present. The metal-working industries, which have traditionally required large numbers of skilled workers, are in the midst of the automation revolution, with automatic machine tools that perform complicated jobs.

"The first industrial revolution of one hundred and more years ago replaced the muscle power of animals and human beings with steam and electric-powered machines, operated by machine tenders. Automation replaces machine operators by supervisors of automatically controlled operating systems. In addition, the not-too-distant future will see the increased peacetime use of atomic energy and the possible use of solar energy by industry and commerce.

"Rapid and radical changes in technology are creating vast changes in machines, production methods, work-flow, office procedures, manpower requirements, labor skills and industry location. They are also creating great changes in products. Printed circuits and transistors are replacing wiring and tubes in electronic equipment. New plastics are replacing metals for various purposes. Radioactive isotopes, by-products of atomic reactors, are widely used in industry.

"Such radical technological changes can result in increased productivity, improved national strength and living conditions, better public services and increased leisure. In the long run, such social and economic gains will probably be achieved, as the benefits of automation are spread to all groups in the population and as society adjusts to the new technology. But in this period of transition--in the next 10 to 20 years--the widespread and rapid introduction of radical technological change can create vast social and economic disruptions.

"Radical changes in technology always create some dislocations. Old work skills are made obsolete and new skills are required. Some types of work are eliminated and entire industries are wiped out. Changes in materials and products cause the decline of some industries and the creation of new ones. There are changes in industry location. Entire communities and regions are affected by the decline and birth of industries.

"If radical technological changes are introduced slowly, in an economy whose production and employment are increasing rapidly, social and economic dislocations can be minimized.

"Even under such conditions, however, there would be numerous human and social problems that would require solutions--such as individuals and groups of workers who are displaced, others whose skills are downgraded, communities whose plants have shut down or moved to new locations and workers who require retraining for new skills. But solutions to such localized and specific dislocations are manageable in a rapidly growing economy. They can be developed through such efforts as labor-management cooperation and collective bargaining, training and retraining of workers in new skills, improved social legislation to aid displaced workers and their families, and federal government assistance for economically distressed communities.

"Our experience in the past several years, however, has not been with localized and specific problems of dislocation. Technological change has been radical. Its speed of introduction has been rapid. At the same time, sales and production have risen slowly. As a result, there has been an insufficient number of new job opportunities to provide full-time employment for a growing labor force, as well as for those who are displaced by technological change.

"Since the rapidly spreading use of automation equipment has been accompanied by a slow-down of economic expansion--the real volume of total national production has risen at an average yearly rate of only about 2½ percent since 1953--the human and social problems connected with radical technological change have been widespread and growing.

"In the past 7 years of slowly rising production, sales and jobs, radical technological change has taken a great toll. The potential social benefits of technological advances have been wasted. Much of the economy's rising productivity and growing labor force has been translated, not into the expanded production of needed goods and services, but into rising unemployment and part-time work, idle plants and machines and an increasing number of distressed communities.



"During recent years radical technological change has eliminated hundreds of thousands of unskilled and semi-skilled jobs in factories, railroads and mines, and some skilled jobs, as well. Hundreds of thousands of farmers have also been displaced. Alternative job opportunities at good wages have been scarce for unskilled and semi-skilled displaced workers and there has been an insufficient number of new jobs for the young people who are entering the job market.

"Many a displaced farmer, factory worker, railroad worker and miner is now either unemployed or working part time, at low wages, in retail or wholesale trade or the services. Much of the burden of radical technological change in recent years has fallen on unskilled and semi-skilled workers--individuals and families, with little if any financial resources....

"The experience of the 1920s and 1930s should be a lesson on the results of failure to adjust to rapid technological change. The Great Depression of the 1930s was caused, in part, by the economy's failure to adjust to the widespread introduction of mass production methods in the 1920s. Not only were millions of workers unemployed during the 1930s, but the collapse of markets and sharply reduced profits halted the application of technological advances for many years.

"The decade of the 1960s poses even greater problems of adjustment to technological change than we experienced in the past 10 years. Technological change is speeding up. Almost every AFL-CIO union reports the spread of automatic and semi-automatic machines. Newspapers and magazines also report a speeding up in the pace of technological change--particularly in clerical work, retail and wholesale trade and the services. It is in these types of employment, along with state and local governments, that jobs increased in recent years, while jobs in factories, farms, mines and railroads declined. An increased pace of radical technological change in clerical work, trade and services, however, may halt or slow down the rise of jobs in such employment in the years immediately ahead....

"A proper national economic and social environment is required--an environment in which new full-time job opportunities are increasing at a rapid pace and in which the federal government provides national programs of adequate social cushions to protect workers, their families and communities against the hazards of rapid technological change. Shorter standard working hours are required, too, as productivity rises and labor requirements are reduced. Such an environment is needed to make the achievements of collective bargaining and labor-management cooperation in the workplace truly successful.

"Organized labor welcomes technological change, as providing the basis for potential benefits for the nation and all Americans. In the past, American trade unions made technological progress possible. The present advanced stage of technology in the United States stands as testimony to the acceptance of technological advances by the American people and to the cooperative efforts of organized labor.

"But organized labor insists that the burdens of rapid technological change must be cushioned, that government and business must assume their responsibilities to minimize social dislocations and to provide adequate cushions that will protect workers, their families and communities against the hazards of radical technological advances.

"In our sense of values, as Americans and as trade unionists, human beings and human welfare are more important than machines and technology. In considering the costs of technological advances, one must include more than the cost of buildings and machines alone. The costs of assisting human beings and communities to adjust to changing technology should be included as an important part of the total investment costs in the new technology.

"America needs continuing technological progress. But we cannot and must not permit vast dislocations of workers and their families and disruptions of numerous communities.

"An environment of rapid economic growth and rapidly increasing job opportunities is needed, in order to minimize the dislocations of rapid and radical technological change. As technological progress increases production, with less manpower, standard working hours should be reduced, without any cut of weekly earnings. In addition, labor-management cooperation and collective bargaining procedures are required, as well as government programs, to assist displaced workers, their families and communities in the transition to the new technology....

"As radical technological change spreads, and manpower requirements are cut, standard working hours should be reduced without a reduction of weekly earnings. Legislation, as well as collective bargaining, should produce a reduction of standard working hours, with no reduction of worker's earnings.

"A national economic environment of rapid economic growth and rising full-time job opportunities is a basic prerequisite for an adequate adjustment to rapid and radical technological change.

"A faster rate of economic growth would not be, in itself, a panacea for all problems connected with radical and rapid technological change. It would narrow down these problems to more manageable size. In the work-place, however, there would remain a vast number of specific problems to be solved.

"Even in periods of high and rising employment, the widespread introduction of automatic and semi-automatic machines means that some workers may be displaced and others would be affected by changes in jobs and skill requirements.

"The new technology usually means the elimination of some jobs, down-grading some skill requirements and up-grading others. For many skilled and semi-skilled workers, automation results in making their skills obsolete. The group of workers that has been most directly hit by rapid technological change in recent years has been semi-skilled employees--the machine tenders and machine operators of the older technology, which is now passing from most parts of the economy....

"With the spreading tendency of companies to shut down old plants and to build others in new areas, a comprehensive program of federal government assistance for economically distressed communities is essential--to aid businesses in such localities to change their production lines, to help attract businesses into such areas and to retrain workers in new skills. Such a national effort is needed to prevent the large-scale waste of private and public investment in homes, schools, community facilities, shops, factory structures and old family ties.

"Relocation allowances, under law, as well as collective bargaining, may be necessary to assist workers and their families to move, if they wish, to locations of new job opportunities....

"Many specific and localized problems, related to rapid and radical technological change, can be handled through collective bargaining, labor-management cooperation and joint community efforts, assisted by the federal government. But the major responsibility for providing adequate safeguards and cushions for adjustments to rapid technological change lies with the federal government.

"It is the responsibility of the federal government under the Employment Act of 1946 to pursue policies 'to promote maximum employment, production and purchasing



power.' This responsibility should be fulfilled. Only in an economy that is growing rapidly and creating new job opportunities at a fast pace can the dislocations of automation be held to a minimum....'

DR. CLAGUE:

"Seventy-five years ago the printing trades were among the most highly skilled and highly paid in American industry. They enjoyed a relatively high economic status; they were about as highly organized as any of the trades at that time, and they were enjoying the fruits of prosperity in an expanding industry.

"Then the Linotype machine became a practical printing tool, which made it possible for printing establishments to displace thousands of highly skilled tradesmen. The story was described in detail by Professor George E. Barnett of Johns-Hopkins University in a book titled *Machinery and Labor*, published in 1926....

"Professor Barnett estimated that by January 1904, even allowing for a reduction in work hours from 10 to 8 per day, the potential displacement of hand compositors would be 36,000. However, Barnett went on to point out that the actual displacements resulting in unemployment were far less, amounting perhaps to only half that number. Furthermore, it was in the first half of the period 1890-1903 that the workers suffered the most unemployment. By 1897 economies in production resulting from the use of the Linotype caused an enormous increase in the amount of composition to be done. Barnett concludes that the expanding demand for labor after 1897 more than offset the displacing power of the machine.

"Let me cite another example, the glass industry. For over four thousand years, from the earliest dawn of history to the beginning of the 20th Century, glassmaking was an art in which there were no fundamental changes in its productive processes. Then within a period of two decades, the major segments of the industry were completely mechanized. This story was described in detail by Boris Stern in his study of *Productivity of Labor in the Glass Industry* (BLS Bulletin No. 441, 1927).

"Stern pointed out that early in the 14th Century the French Government decreed that 'none save gentlemen or the sons of gentlemen should engage in (glass-making) even as working artisans. In the Italian States of Venice and Murano each glassmaker, no matter of what origin, was entitled to be called "gentleman glassmaker," thus becoming a nobleman by virtue of his trade alone....'

"At about 1900 there began the introduction of a series of semiautomatic and automatic glassmaking machinery which completely revolutionized the industry. The output per man-hour for the machine processes in comparison with the older hand processes was about 40 times greater for small prescription bottles, about 30 times for electric light bulbs, nearly 15 times for milk bottles, more than 12 times for table tumblers, and lesser multiplying amounts for other types of glass. Labor costs were correspondingly reduced in the machine process to less than 3 percent in small prescription bottles, to somewhat more than 3 percent in electric light bulbs, to about 5 percent in milk bottles, and to less than 7 percent in table tumblers....

"In 1927-28, I myself had the opportunity to participate in a BLS study of 'Productivity in the Iron and Steel Industry.' A report was published titled *Productivity of Labor in Merchant Blast Furnaces* (BLS Bulletin No. 474, 1929). At that time, the blast furnace industry was in the midst of a transition from the older methods of hand charging and sand casting to mechanical methods (the skip-hoist, the pig casting machine). The introduction of machine methods in a blast furnace was usually accompanied by a reduction of 50 percent or more in the loading and casting crews. This was a case of the elimination of common labor and of hot, unpleasant

and back-breaking work. Within a period of less than a decade machine methods took over, except for the production of certain specialty products. The introduction of these machine methods was an important factor in the increase in output per man-hour in merchant blast furnace operations in the middle 1920's.

"We read in the papers today about similar spectacular labor-saving machines or processes--the automatic engine plant, the giant coal digger-shovel, the electronic computer and many others. The word 'automation' merely characterizes some of the characteristics of recent methods of mechanization....

"The broadest effect of changing technology is on the economy as a whole. We measure this in the form of indexes of changing output per man-hour of labor. This doesn't mean that we consider labor to be the only factor in production, nor that labor is solely responsible for increasing productivity. Rather we center attention upon labor because, for the economy as a whole, it is by far the largest input (comprising as much as four-fifths of the total cost of production), and because the workers constitute the group who bear the brunt of the consequences of technological change....

"The benefits flowing from technical improvements in production are so well known and so generally recognized that there is no need for me to do more than record them. The overall rate of productivity gain is the most important factor in the nation's rate of economic growth. We estimate that the labor force is increasing at a rate of about 1.5 percent a year. This could produce a 1.5 percent annual increase in total output. A growth rate of 4 or 5 percent can only be achieved through higher productivity. However, the increased output due to a larger supply of workers doesn't provide more goods and services for each worker and his family. A rise in the average level or standard of living can come only from rising productivity per worker. Shorter hours and leisure time are also the fruits of technological efficiency.

"Yet at the same time we must bear in mind that these changes have social and economic costs which must be met. Our problem as a nation is how to distribute these costs equitably and how to share the benefits and the burdens of industrial change.

"...During the last few years a number of important experiments have been undertaken jointly by individual companies and unions. One example is the collective agreement between the Armour Meatpacking Company and two unions--the Amalgamated Meat Cutters and Butcher Workmen and the United Packinghouse Workers. (MLR, October 1959.) In this case the management and the unions joined in a study program to find out what could be done to meet the difficult problems faced by the company and the industry. The company has found it necessary to close obsolete plants and concentrate production elsewhere. In the agreement the company arranged to establish a fund of \$500,000 to be used to study the problems resulting from the modernization program and to make recommendations for their solution, including training employees to perform new and changed jobs and promoting employment opportunities within the company for those affected. A joint labor-management committee under the direction of an impartial chairman has been conducting studies for the past year on the experiences of this company.

"The closing of one plant in Oklahoma provided an opportunity to try out some methods of readjustment. Training programs were offered, but not all workers signed up for them. Some lacked the basic education needed for training. Some who took the training did not find jobs....

"In the steel industry, the Kaiser Company and the United Steel Workers have jointly established two committees to study the subject: one Committee to deal with

internal working rules, and the other, a long-range committee, to work on the problem of sharing the benefits of higher productivity among the workers, the management, and the consumers....

"In 1959 the Pacific Maritime Association signed an agreement with the International Longshoremen's and Warehousemen's Union providing for the creation of a fund of \$5 million per year for 5-½ years. This agreement gives the employers a freer hand in introducing technological improvements in longshoring. The union obtains the benefits of the fund, supplying the following listed benefits to the workers: minimum weekly earnings guarantee, early retirement or lump sum payment at normal retirement age, separation allowances, disability and death benefits, and other protective devices. It is the hope of the employers that the increases in productivity will be sufficient to offset the cost of the fund.

"It is surely evident that government has an important part to play in assisting labor and management to deal with this problem.

"One function of the government is the provision of information on the subject. For many years the Bureau of Labor Statistics has produced analyses of future manpower needs. The Bureau produces the *Occupational Outlook Handbook*, which summarizes in outline form the job prospects for young people in some 600 occupations. A new edition of this *Handbook* is issued every two years. The 1961 edition will become available next autumn. The purpose of this book is to enable young workers to select occupations in which there is a bright economic future, and in which they will be needed.

"Second, the publication of facts concerning the experiences of labor and management have proven useful. For several years the Bureau has published automation case studies--in an insurance company, a manufacturing plant, a bakery, a petroleum refinery and an airline reservation system. These studies showed the ways in which company managements, either on their own initiative or in cooperation with the union, introduced the new equipment--advance explanation to employees, assurances of job security, provision of opportunities for transfer or retraining, use of normal attrition to take care of employment declines, etc....

"In conclusion, I want to say a few words about the responsibilities of engineers. In using that term, I am including not only the engineering profession in a narrow sense, but also the chemists, the physicists, the scientists, and all research and development staff who are engaged in developing industrial innovations.

"You can render a service to the Nation by making your technical knowledge available to those agencies in government and in private industry which are studying the impact of automation....

"Finally, you who are the creators and developers of the new technology have an interest as citizens in the social and economic consequences of your activities. The highest efficiency of the new machines and methods can be achieved only if there is willing acceptance and active cooperation on the part of the workers who operate them...."

MR. MYERS:

"Automation is simply a modern phase of technological change. Some would distinguish it from the older varieties on the ground that it makes greater use of self-regulating devices, computers and transfer machines. Perhaps a case can be made for such distinction. But I am very doubtful that it would help us very much in dealing with the problems growing out of automation....

"We are interested, of course, in knowing whether technological change is proceeding more rapidly than it formerly did. But we have no satisfactory means of measuring this process directly. Instead, we fall back on the measurement of 'productivity,' the relationship of the 'output' of the productive process to the 'input' of labor, management, equipment, and so forth.

"It is very common to measure productivity as a ratio between the output of goods and services and the input of human labor, expressed in man-hours. Output per man-hour is only one of several measures that could be used, but it is particularly appropriate in the United States where human values are paramount. It provides a rough indicator of the rate of technological change.

"Because the measurement of productivity is so important in understanding the changing American economy, the Bureau of Labor Statistics has given considerable attention to this subject. Last year we published a detailed statistical study of productivity trends over a period of 50 years. (*Trends in Output per Man-Hour in the Private Economy, 1909-1958*. Bulletin No. 1249). In this study and in subsequent extensions of the statistics, we found that output per man-hour in the private economy rose by an average of about 2.4 percent per year over the entire period 1909-1959. But since World War II (1947-59) it has risen at an annual rate of nearly 3.4 percent. This suggests that technological change has been taking place somewhat more rapidly since the war than in the preceding four decades.

"Part of the acceleration after World War II was due to the extraordinary gains in agriculture, where output per man-hour rose at an average annual rate of over 6 percent. We cannot expect to maintain such a rate indefinitely. But even the nonfarm sector has shown a more rapid increase (2.8 percent) since the war than it did over the 50 years as a whole (2.1 percent).

"The level of our productivity increase indeed seems quite modest. At first blush it is difficult to believe that so small a gain could vitally affect the economy. But even the long-term average increase of 2.4 percent annually is sufficient to double the output per man-hour about every 30 years. And rising productivity has meant rising real incomes and a higher standard of living.

"We cash in on part of our rising productivity through increased leisure time, part through increased personal consumption of goods and services. But we also count on rising productivity to enable us to compete successfully in international trade, despite the high wages we pay. We count on it to improve our defense strength, to support foreign aid to developing countries. In short, technological advance is the source of our high level of living and of much of our national greatness.

"Despite its great potentialities for good, technological change is often regarded with suspicion and fear. The gains in living standards and in national strength which it brings may involve heavy cost to a small but significant part of the labor force who lose their jobs and their occupations.

"This baleful aspect of automation has long been recognized. Take the case of Walter Hunt, a New Yorker who invented a sewing machine in the 1830's, but didn't patent it because he feared the mass unemployment of seamstresses. Later, of course, Elias Howe's introduction of his own machine demonstrated the futility of Hunt's approach, and the expansion of the ready-to-wear apparel industry demonstrated its error.

"Much later a great nation, one of our allies, delayed the introduction of typewriters into its government offices for years because of its concern over the fate of its scores of copyists and record keepers who worked by hand.



"As recently as the 1930's a Committee of Congress seriously considered a moratorium on labor saving inventions for fear they would aggravate the unemployment problem. I wonder where the American economy would have been in World War II if this proposal had been adopted!

"What are the dimensions of occupational displacement? How long are the displaced workers out of work before they find other steady jobs? We don't have specific answers to these questions; strictly speaking, they are unanswerable. In many cases it is impossible to determine whether a displaced worker has lost his job because of automation, because of growing consumer preference for a competing product, because of simple bad management by his employer or for some other reason....

"Another way to view the question is to start out with the average increase in output per man-hour (in the private economy) of 2.4 percent. In an economy employing some 67 million, and assuming no change in average hours, this rate of gain would permit the same output of goods and services each year with some 1.6 million fewer workers than the year before. It is unrealistic, of course, to consider this number as actually thrown out of work each year, since productivity tends to level off when the economy is stagnant; in other words, when productivity is rising we won't produce the same amount of goods and services, but a larger amount. Some of the displaced workers will be quickly absorbed. On the other hand, there is always a carry-over of workers who were displaced in earlier years and have not yet found employment....

"We know, however, that the number of persons receiving unemployment benefits in the Pittsburgh Metropolitan Area in mid-May was 81,500, and the total number of unemployed was undoubtedly appreciably greater. Instead of speculating on the number of these who may be unemployed due to automation, I propose to consider what has happened in three industries of considerable importance to Pittsburgh and to the Nation and in which technological change has exercised profound influence.

"*Coal.* One of these is coal. In 1947 this industry employed more than 400,000 production workers. From 1947 to 1959 mechanization of loading, the growth of strip mining and the use of continuous mining machines have contributed to the virtual doubling of output per man-hour. Only this week I have read of a monstrous new power shovel being developed for strip mining, taller than Niagara Falls and capable of ripping up more than 100 tons of earth and rock in a single bite. At the same time--and this is an important point to note--coal mining has suffered from technological change in other industries....

"*Railroads* have undergone a similar though somewhat less drastic change in productivity. Output per man-hour (for production workers) rose by 65 percent from 1947 to 1959. Here mechanization of maintenance of way, the introduction of powerful diesel locomotives and centralized traffic control were largely responsible for the impressive gains....

"*Steel.* The steel industry has had a somewhat similar experience. From 1947 to 1959 (a strike year, but probably as suitable for this comparison as any recent year), output per man-hour (for production workers) rose by 42 percent. Production increased by some 15 percent, but production worker employment dropped by 20 percent. The impact of technological change on employment in steel has, then, been less drastic than in coal mining and railroads....

"From a consideration of such examples of technological change, it would be easy to paint a gloomy picture of the future--one in which the machines take over and nobody has a job except a few 'programmers' and a few aides whose job is to press the starting buttons. But there is no justification for such an outlook.

Technological change, as we have seen, has been with us for a long time without resulting in a growing body of permanently unemployed. Earnest students of unemployment have failed to find any convincing evidence that the long-run trend of joblessness has been upward.

"That is not to say that we can afford to ignore the social ramifications of automation. There are practical steps that can be taken to reduce the incidence of technological unemployment and to mitigate its unfavorable consequences....

"More specific steps can be taken to prevent displacement and hardship in specific situations. We are accumulating a good deal of information about methods that have been used successfully in recent years. Here are some of the steps which have proved effective:

"(a) Advance planning by management is highly essential if some of the preventive steps that are possible are actually to be taken.

"(b) Employees should be informed well in advance and their cooperation requested in making a smooth transition.

"(c) Full advantage should be taken of attrition as a means of reducing staff. Often attrition alone is sufficient to accomplish the necessary reduction if planning is begun far enough in advance.

"(d) A program should be launched to transfer employees who are likely to be affected by automation to jobs left open by separations, or to recruit them to fill new jobs that will be created as a result of automation. This is a big job. It will involve accurate assessment of abilities, effective persuasion and very frequently retraining.

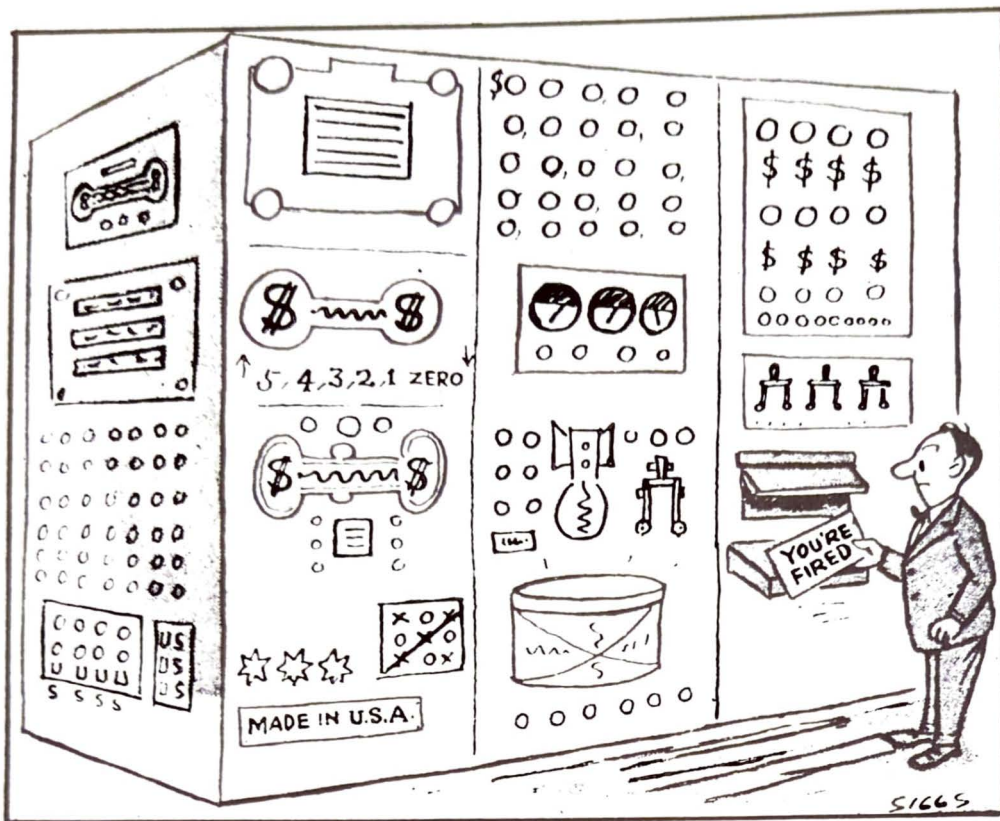
"(e) Obviously the planning of new jobs must be carried on simultaneously with preparations to dispense with old ones.

"(f) Finally, where lay-offs are inescapable, they should be carried out in an orderly manner, with ample warning ahead of time in order to minimize hardship....

"Finally, government has a part to play. Government has special advantages in the field of occupational counseling. Young workers must be discouraged from entering trades that are likely to dwindle or disappear. The *Occupational Outlook Handbook* of the BLS provides information on the outlook in hundreds of occupations and is a tool of tremendous usefulness to all counselors. Good basic education and vocational training are essential in an economy that will rely more and more on scientific knowledge and a high degree of skill. In some cases, as in the railroad industry, government can play a part in resolving the thorny issues that separate labor and management.... But preventive measures will not be enough...."

#### CONCLUSIONS AND RECOMMENDATIONS

1. That the American Federation of Teachers believes the teachers should take the leadership in making the public aware of automation.
2. That the American Federation of Teachers will continue to seek solutions to the problems concerning automation before they become impossible.
3. That the American Federation of Teachers urges additional study of automation by its members, the labor movement, the government, and the general public.



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"Wait till automation reaches management levels—then we won't hear so much about 'learning to live with it.'"